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and upland is so marked that no adequate idea of the pastoral value of the country can be obtained along the road routes, as these in most cases follow the valley floors. The key to the distribution of moisture is found in the topography and the fact that the area lies in the belt of westerly winds. The higher ranges and uplands to the west intercept the moisture, and are themselves snow-covered, while the eastern plains and plateaux in the lee of the mountains experience excessively dry Foehn winds that dry up the struggling vegetation and parch the land. "The country in its natural state is quite destitute of trees and all forest vegetation." The steep slopes leading from valley bottom to plateau top are rugged and broken and supply innumerable places of shelter and refuge for the prolific rabbit, the scourge of the sheep farmer throughout Central Otago.

It seems ungrateful, in view of the many excellent features of this report, to object to matters of detail, but when these details affect an important principle the criticism appears to be justifiable. We cannot approve the first sentence in the chapter on physiography: "An elevated peneplain may be (a) an uplifted coastal plain; (b) an uplifted base-level formed in accordance with Powell's cycle of fluviaatile erosion; or (c) a desert upland in an arid climate truncated by long-continued subaerial erosion in terms of Passarge's postulate." If this statement is based upon the conception that a peneplain means "almost a plain" as the etymology of the word indicates, and is used without regard to its mode of origin, we can understand the statement referred to, though many "almost plains" are not included in such a meagre classification. But this interpretation of the word is not correct. A condition more or less closely approaching the base-leveled one is the connotation of the word "peneplain"; as for a truncated desert upland, the word levelled as vs. base-levelled has been suggested (Davis: "The Geographical Cycle in an Arid Climate": *Jour. of Geology*, Vol. XIII, No. 5, July-August, 1905); and "an uplifted coastal plain" can in no sense of the word be called a peneplain unless it has been peneplained after uplift and again elevated. If it is argued that such a base-levelled coastal plain is described in the last paragraph of the section in which the statement is made, we are still at a loss to know why *all* land forms of youth or maturity that are subject to peneplaination were not included in the classification of what "an elevated peneplain *may* be." I. B.

A Sketch of the Geography and Geology of the Himalaya Mountains and Tibet. By Col. S. G. Burrard, R.E., F.R.S., and H. H. Hayden, B. A., F.R.G. Four Parts. Geological Survey of India, Calcutta, 1907. (Price, 2 rupees each.)

The Geological Survey of India has published four papers under the above title. Col. Burrard, one of the authors, is Superintendent of the Trigonometrical Survey, and the other, H. H. Hayden, is Superintendent of the Geological Survey of India. Part I is devoted to "The High Peaks of Asia"; part II to "The Principal Mountain Ranges of Asia"; part III to "The Rivers of the Himalaya and Tibet"; part IV, "The Geology of the Himalaya," has not yet reached this Society. The parts, issued in quarto form, are illustrated with many charts and diagrams and a few other illustrations, and a great deal of information is compressed into tables.

These publications are very timely. Geographical and geological information has been accumulating for a century, and students are now in danger of losing their way in a mass of unclassified detail. These papers have, therefore, been prepared to co-ordinate the varied observations, to show how far geological and geographical

knowledge has progressed and to indicate directions that appear favourable for future lines of advance. The three parts, now before us, are mainly geographical and the fourth is wholly geological. The parts are subdivided into sections and with each section in the table of contents is given the name of the author responsible for it. Attention is particularly called in this notice to Part I, "The High Peaks of Asia."

All the peaks of Asia exceeding 24,000 feet in height are catalogued, in order of magnitude, in five tables. There are seventy-five of these peaks of which the five highest are Mount Everest, 29,002 feet; K₂, 28,250 feet; Kinchinjunga I., 28,146; Kinchinjunga II., 27,803 feet; and Makalu, 28,790.

Eleven peaks are between 26,000 and 27,000 feet in height; thirty-two between 25,000 and 26,000 feet; and twenty-seven between 24,000 and 25,000 feet.

The discussion given to Mount Everest is longest and most interesting, because new computations of its height prove conclusively that its elevation is somewhat greater than the value accepted for the last half century. There is little probability now of a higher peak than Mount Everest being discovered, and even the prospect of finding new peaks of 27,000 or 26,000 feet is becoming remote. The view long held that peaks higher than Mount Everest were standing behind it to the north is no longer tenable, for when Major Ryder traversed Tibet along the Brahmaputra in 1904 he passed 80 miles north of Mount Everest and found no peak approaching it in height.

The height of 29,002 feet assigned to Mount Everest in 1852 was the mean of the different values for the height obtained by trigonometrical surveys in 1849 and 1850 at six stations, all south of the mountain. Between 1881 and 1902 six other determinations of its height, made at five stations, all except one nearer to the mountain than any of the earlier stations, give a mean value of 29,141 feet after correction for refraction.

"The height 29,141 is still probably too small, as it has yet to be corrected for the effects of deviations of gravity. Though it is a more reliable result than 29,002, the latter value is still to be retained in maps and publications of the Survey. We cannot claim to have solved the problems of refraction, nor to have eliminated all uncertainties. Our knowledge of the deflections of gravity is still but superficial, and although we may endeavour continually to improve our heights, it would be a mistaken policy to introduce new values at every step of the investigation. Values of heights . . . furnish means of identification and are not to be altered frequently or without good reason. . . . We have discussed the height of Mount Everest to show the degree of uncertainty attaching to it, but we do not propose to substitute 29,141 for the long adopted and well known value 29,002."

K₂ has been supposed to be the second highest mountain on the earth, but its height does not differ much from that of Kinchinjunga, and it cannot yet be stated with certainty which is the higher of the two.

Of the 75 great peaks included in tables 1 to 5 only 19 have native names. If the lower peaks are taken into account, there are many thousands of prominent but unnamed summits in Asia and the problem of nomenclature has to be considered.

"It would be a mistake to attempt to attach an actual name to every peak. Astronomers do not name the stars; in olden times they grouped them in constellations, and they now number them according to right ascension. Colonel Montgomerie endeavoured to introduce for peaks a method resembling that of constellations, and he named the whole Karakoram region K and its peaks K₁, K₂, K₃, etc. This system would have answered well, but Colonel Tanner and subsequent surveyors have departed from it, and have adopted the plan of designating each peak by the initial letter of the observer. Tanner called, for instance, the peaks he had himself observed, T₄₅, T₅₇, etc. The employment of observers' initials has led to confusion; two and more observers have had the same initial, and the same symbol has thus become attached to different peaks."

The authors believe there is no better plan for Tibet and Turkestan than to use in those regions the simple system introduced by Montgomerie for the Karakoram.

The paper discusses the errors of the adopted values of height. The values given

in the tables published in the paper, the authors say, must be accepted with caution. Some are more reliable than others, but none is correct to a foot, and many investigations will have to be completed before altitudes can be determined with a greater degree of accuracy than at present.

"All observations are liable to error; no telescope is perfect, no level is entirely trustworthy, no instrumental graduations are exact, and no observer is infallible. . . . Errors of measurement, however, can be greatly reduced and rendered practically negligible, if a peak be observed with a good theodolite on several occasions and from different stations."

Table XIV shows that 887 peaks have been discovered in the Himalaya and in Tibet exceeding 20,000' feet in height. Analyses of the great peaks of the Himalaya and Karakoram are given in a series of tables and charts show the geographical position of peaks of various magnitudes and the outlines of some of the great mountains and ranges.

The Topography and Geology of the Peninsula of Sinai (Southeastern portion). By W. F. Hume, Superintendent Egyptian Geological Survey. 280 pp. Maps, Photographs and Index. Survey Department, Cairo, 1906.

This large octavo is a valuable contribution to geography. Scarcely any traveller has examined the southeastern part of the Sinai peninsula and still fewer have mapped any portion of it. The Admiralty sheets, of course, correctly outline the coasts, but our general knowledge of the region has been superficial. It is almost entirely a desert of rock, gravel and boulder, and many arid valleys, plateaus and ridges, the whole forming a scene of desolation. Yet here and there, where, after sudden thunder storms, the waters rush down the main valleys, are found some fertile spots, oases of palms, seyal trees and rushes making pictures full of life and beauty. The inhabitants of these fertile spots have a good reputation for honesty and independence of character. They are active climbers, keen sportsmen, and the necessity of finding water and camel food brings the natives into close acquaintance with every recess of their hills.

Over half the work is given to a detailed description of the geography and topography of Eastern Sinai and to extended notes on the botanical, zoological and economic features of the region. Six chapters describe the geology, and the appendices certain detailed reports on the meteorological observations and the structure of the igneous region, with lists of plants and previous literature. The work will be welcomed as authoritative on all phases of the Southeastern part of the peninsula. The maps are noted in *New Maps* in this number.

Gesammelte Abhandlungen aus den Gebieten der Meteorologie und des Erdmagnetismus. Von Wilhelm von Bezold. viii and 448 pp., 66 Diagrams and 3 Maps. Friedrich Vieweg & Son, Brunswick, 1906.

Scientific specialists always welcome the collections of the lectures and papers of authoritative fellow-workers, because it is not so convenient to refer to them when they are scattered through various publications. It is gratifying that the literary output of so eminent a meteorologist as the late Prof. Dr. Bezold was put together by the lamented author the year before his death and published in this handsome volume. The collection opens with Bezold's "Beobachtungen über die Dämmerung," published in 1864, which spread the author's fame as a meteorologist far beyond his own country. Then follow three lectures upon storms, in which the author discusses the frequency and intensity of storms in their relation